

STUDIES IN NEOTROPICAL SENECIONEAE, COMPOSITAE
I. REINSTATEMENT OF GENUS LASIOCEPHALUS

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In the process of reassessment of the generic status of the Andean species of Senecioneae, the evaluation of the Schlechtendal genus Lasiocephalus is of major importance. Since Bentham, most of Lasiocephalus species, along with a few hundred other members of neotropical Senecioneae, have been treated as belonging to the large and heterogeneous genus Senecio. I have followed this wide concept in previous years while gathering material and information for a review of the northern Andean species. Many of the latter were known to depart from the natural concept of Senecio L. It was on this basis that genera like Paragynoxys Cuatr. (1955), Paracalia Cuatr. (1960) and Pseudogynoxys Cabrera (1950), among others, were established.

It is not my purpose to review the situation of the Senecioneae now. At this time I am particularly concerned about the large number of Andean species which fall into the sections Microchaete Benth., Triana Cuatr., Streptothamni Greenm., Aetheolaena Benth. and Culcitium auct. var., including Lasiocephalus, and the urgency to clarify their generic status. The first step in that direction already has been taken with the revival of the generic name Pentacalia Cassini by Robinson & Cuatrecasas (1978) on the occasion of a revision of the Central American species of that genus; see the comments made in that paper.

The genus Lasiocephalus was established by Willdenow, but published by Schlechtendal (1818), based on two species: L. ovatus and L. lingulatus, both from the high Andes of Ecuador. S.F. Blake (1937) reviewed Schlechtendal's work and transferred the two species to Culcitium, in accordance with the artificial concept prevailing at that time. When I merged the artificial concept of Culcitium into Senecio (Cuatrecasas 1950, p. 47, 48, 51; 1951, p. 38, 73), both species of Lasiocephalus were transferred to Senecio. On the other hand, B. Nordenstam (1978), in an important recent paper on the taxonomy of the Senecioneae, has reestablished the genus Aetheolaena Cassini, typified by Calalia involucreta HBK. Most of the 18 additional species included in his treatment were extracted from Senecio sensu amplissimo; they are among themselves very closely related, suffrutescent climbers with discoid capitula forming a very natural group. But a few other species included are "ascending halfshrubs" which had been initially described as Culcitium or Lasiocephalus (C. ascendens Benth., C. puracensis Cuatr., L. lingulatus Schlecht.). Considering the range of variability of most of the characters, such as the structure of the calycle, number of phyllaries in the involucre, size of the capitula, number of flowers in each, shape of the leaves and apical appendage of the styler branches,

it would have been difficult to exclude from the new genus the above mentioned species of Lasiocephalus, formerly in Culcitium. These species not representing climbers are more or less flexuous subshrubs with tortuous, fruticose, often reptant ligneous bases; their leaves have more narrow-elliptic or oblong, subcoriaceous blades with revolute margins, the petioles tending to become broader or laminar and amplexant. The corollas may have an obvious campanulate limb or may be narrower, or broadly tubular, the variation being observed occasionally in a single head. Variation in size of the apical appendages of the styler branches have been observed in specimens of L. lingulatus, puracensis, gargantanus, adscendens, and ovatus. In well preserved specimens the apical tuft of trichomes is usually well developed and very conspicuous, but sometimes it appears to be more or less reduced. Nevertheless, this feature has been found to be present in most cases for each species, indicating its generic significance. Because of the controversial case of Lasiocephalus ovatus, several specimens from widely dispersed localities have been closely examined. This examination indicates that L. ovatus should not be excluded from the concept of Aetheolaena sensu Nordenstam. Willdenow and Schlechtendal were both right in considering congeneric their two species of Lasiocephalus. Lasiocephalus ovatus conforms well with the characters selected and listed in the Nordenstam diagnosis of Aetheolaena. The species belongs to this relationship and it falls particularly close to the Culcitioid species. Its anthers are obtuse, ecaudate at the base, the endothelial cells have radial thickenings; the style branches are apically convex with a central coma of trichomes longer than the marginal crown of hairs. In some cases this character is less obvious, but in general it is consistent (e.g., Aplund 7412). The leaves in L. ovatus have a long petiole; this is membranaceous, laminar, appressed to the stem. These leaves are fundamentally like those in, e.g., L. lingulatus or L. puracensis. Lasiocephalus ovatus may be considered as derived from the lingulate type as a morphological adaptation to a higher altitude, the leaves increasing in number, becoming crowded, the blades becoming smaller and thicker, the petioles longer, flatter, appressed and imbricate; the heads become larger and the whole plant more densely woolly. This evolutionary adaptive variation in habit morphology takes place similarly in a convergent or parallel way in other genera that apparently migrated from a lower altitude to the superparamos.

An important parallel morphological change experienced by Andean genera of the Senecionae under the influence of the highest altitudes is the increase in number and length of the calycular bracts. These become more numerous and similar to the phyllaries in shape, they are imbricate, and their positions, progressively closer to the involucre, simulate a multi-seriate, imbricate involucre. This particular kind of calyculus develops along with an increase in the size of the heads; this disposition, when developed at maximum, is the characteristic of Culcitium H. & B. But the fact is that in all "Culcitia" the true involucre remains of the Senecio type: one row of subbiserial, subuniform, closely parallel, linear or narrow-

elliptic phyllaries. The calycle bracts are external and variable in number. They vary greatly with the species, and their presence cannot be used alone to characterize a genus. "Culcitioid" calyculate heads are found at high altitudes in members of several genera: Senecio, Lasiocephalus, Pentacalia, and in parallel ways in different sections of some of these. The plasticity in shape of some species in the ecologic zones of transition can be observed within the range of a single species, particularly, e.g., with the polymorphic L. otophorus.

An idea of the variability of some macrocharacters in Lasiocephalus is shown by the variation in size of the heads as seen in the number of the phyllaries and the number of flowers per capitulum. Among the typical Aetheolaena group of species, the number of phyllaries is 12-21, being most frequently between 16 and 21. The number of flowers goes from 30 to 100 (-140). In the Lasiocephalus culcitioid group, the involucre vary from 20 to 35 phyllaries, the number of flowers going from 105 to 406.

The genus can be divided into two subgenera: (1) Lasiocephalus with the species with flexuose ascending stems and somewhat larger heads; and (2) the Aetheolaena with the suffrutescent larger climbers with usually smaller heads.

Since L. ovatus is the type species of Lasiocephalus, this name takes priority over Aetheolaena Cassini. The following nomenclatural and taxonomic transfers will be necessary.

LASIOCEPHALUS Schlechtendal, ampliatum Cuatr.

Schlechtendal, Ges. Naturf. Fr. Berlin Mag. 8: 308. 1818. Type species L. ovatus Schlechtendal.

Aetheolaena Cass. Dict. Sci. Nat. 48: 453 (1827). Nordenstam emend. Opera Bot. 44: 53. 1978.

Senecio sect. Aetheolaena (Cass.) Hoffm., Pflanzenf. IV-5: 301. 1894.

Senecio sect. Reflexum Cuatr. in part, included type, Fieldiana Bot. 27(1): 51, 1950; 27(2): 73, 1951.

LASIOCEPHALUS CALDASENSIS (Cuatr.) Cuatr., comb. nov.

Senecio caldasensis Cuatr. Notas Fl. Colom. VI: 28. 1944.

Aetheolaena caldasensis (Cuatr.) Nord. Opera Bot. 44: 54. 1978.

LASIOCEPHALUS CAMPANULATUS (Sch. Bip. ex Klatt) Cuatr., comb. nov.

Senecio campanulatus Sch. Bip. ex Klatt, Leopoldina 24: 126. 1888.

Aetheolaena campanulata (Sch. Bip. ex Klatt) Nord. Opera Bot. 44: 54. 1978.

LASIOCEPHALUS CUENCANUS (Hieron.) Cuatr., comb. nov.

Senecio cuencanus Hieron. Bot. Jahrb. 19: 65. 1894.

Aetheolaena cuencana (Hieron.) Nord. Opera Bot. 44: 54. 1978.

LASIOCEPHALUS DECIPIENS (Benoist) Cuatr., comb. nov.

Senecio decipiens Benoist, Bull. Soc. Bot. France 83: 807. 1936.

LASIOCEPHALUS DORYPHYLLUS (Cuatr.) Cuatr., comb. nov.

Senecio doryphyllus Cuatr. Proceed. Biol. Soc. Washington 74: 18. 1961.

Aetheolaena doryphylla (Cuatr.) Nord. Opera Bot. 44: 54. 1978.

LASIOCEPHALUS GARGANTANUS (Cuatr.) Cuatr., comb. nov.

Culcitium gargantanum Cuatr. Rev. Acad. Colomb. Cienc. 5: 29, fig. 16. 1942.

Senecio gargantanus (Cuatr.) Cuatr. Fieldiana Bot. 27(1): 44. 1950.

LASIOCEPHALUS HETEROPHYLLUS (Turcz.) Cuatr., comb. nov.

Gynoxys heterophylla Turcz. Bull. Soc. Nat. Mosc. 24(2): 85. 1851.

Senecio pindilicensis Hieron. Bot. Jahrb. 19: 65. 1894.

LASIOCEPHALUS INVOLUCRATUS (HBK) Cuatr., comb. nov.

Cacalia involucrata HBK, Nov. Gen. Sp. 4: 130. 1818 ed. folio.

Senecio involucratus (HBK) DC. Prodr. 6: 422. 1838.

Aetheolaena involucrata (HBK) Nord. Opera Bot. 44: 54. 1978.

LASIOCEPHALUS LINGULATUS Schlechtendal, Ges. Naturf. Fr. Berlin Mag.

8: 309. 1818. Type: Humboldt, in Herb. Willdenow, Cat. No.

16435, metric label 4247/B, "Lasiocephalus lingulatus (W)" (holotype).

Cacalia arenaria HBK, Nov. Gen. Sp. 4: 129. 1818, ed. folio.

Culcitium ledifolium HBK, Nov. Gen. Sp. 4: 133. 1818, ed. folio.

Senecio sabulosus DC. Prodr. 6: 422. 1837.

Culcitium adscendens Benth. Pl. Hartw. 205. 1845.

Culcitium lingulatum (Schlecht.) Blake, Journ. Wash. Acad. Sci. 27: 390. 1937.

Senecio neoadscendens Cuatr. Fieldiana 27(1): 45. 1950.

Senecio lingulatus (Schlecht.) Cuatr. Fieldiana Bot. 27(1): 44. 1950.

Aetheolaena lingulata (Schlecht.) Nord. Opera Bot. 44: 54. 1978.

LASIOCEPHALUS LOESENERI (Hieron.) Cuatr. comb. nov.

Senecio loeseneri Hieron. Bot. Jahrb. 36: 510. 1905.

Aetheolaena loeseneri (Hieron.) Nord. Opera Bot. 44: 54. 1978.

LASIOCEPHALUS LONGIPENICILLATUS (Sch. Bip. ex Sandw.) Cuatr., comb. nov.

Senecio longipenicillatus Sch. Bip. ex Sandw. Kew Bull., 1941: 226. 1942.

Senecio nevadensis Wedd. Chl. And. 1: 97. 1856, non Boiss. & Reut. 1852.

Senecio pittieri Cuatr. Field. Bot. 27(1): 34. 1950.

Aetheolaena longipenicillata (Sch. Bip. ex Wedd.) Nord. Opera Bot. 44: 54. 1978.

- LASIOCEPHALUS MOCHENSIS (Hieron.) Cuatr., comb. nov.
Senecio mochensis Hieron. Bot. Jahrb. 29: 68. 1900.
Aetheolaena mochensis (Hieron.) Nord. Opera Bot. 44: 54. 1978.
- LASIOCEPHALUS OTOPHORUS (Wedd.) Cuatr., comb. nov.
Senecio otophorus Wedd. Chl. And. 1: 98. 1856.
Aetheolaena otophora (Wedd.) Nord. Opera Bot. 44: 56. 1978.
- LASIOCEPHALUS OVATUS Schlechtendal, Ges. Naturf. Fr. Berlin Mag. 8: 309. 1818.
Gnaphalium uniflorum Lamark, Encycl. 2: 752. 1788, not G. uniflorum Miller 1768.
Culcitium reflexum HBK. Nov. Gen. Sp. 4: 134, Tab. 362. 1818, ed. folio.
Culcitium uniflorum (Lam.) Hieron. Bot. Jahr. Engl. 19: 63. 1894.
Culcitium ovatum (Schlecht.) Blake, Journ. Wash. Acad. Sci. 27(0): 389. 1937.
Senecio reflexus (HBK) Cuatr. later homonym, not Senecio reflexus HBK, Fieldiana 27(1): 44. 1950.
Senecio superandinus Cuatr. Fieldiana 27(2): 38. 1951.
Type: Humboldt, monte Pichincha, Ecuador. Herbarium Willdenow Cat. No. 16434, metric label 4246/B, "Lasiocephalus ovatus (W)" (holotype). Humboldt & Bonpland "no. 2280 Culcitium reflexum mihi" in HBK herbarium, holotype of Culcitium reflexum (P), Photo. F.M. 37832. Bonpland 2280, Antisana, isotype (P).
- LASIOCEPHALUS PATENS (HBK) Cuatr., comb. nov.
Cacalia patens HBK. Nov. Gen. Sp. Pl. 4: 129. 1818, ed. folio.
Senecio patens (HBK) DC. Prodr. 6: 423. 1838.
Senecio bullatus Benth. Pl. Hartw. 208. 1845.
Gynoxys prenanthifolia Turcz. Bull. Soc. Nat. Mosc. 24(2): 86. 1851.
Gynoxys auriculata Turcz. Bull. Soc. Nat. Mosc. 24(2): 86. 1851.
Aetheolaena patens (HBK) Nord. Opera Bot. 44: 56. 1978.
- LASIOCEPHALUS PICHINCHENSIS (Cuatr.) Cuatr., comb. nov.
Culcitium pichinchense Cuatr. An. Univ. Madrid 4(2): 215, reprint p. 2, fig. 4. 1935. Type: Isern 308; MA, holotype; F, isotype.
Senecio pichinchensis (Cuatr.) Cuatr. Fieldiana Bot. 27(1): 44. 1950. Later homonym.
Senecio quitensis Cuatr. Fieldiana Bot. 27(2): 38. 1951.
- LASIOCEPHALUS PURACENSIS (Cuatr.) Cuatr., comb. nov.
Culcitium puracense Cuatr. Not. Fl. Colomb. VI: 31. 1944.
Senecio puracensis (Cuatr.) Cuatr. Fieldiana Bot. 27(1): 44. 1950.
Aetheolaena puracensis (Cuatr.) Nord. Opera Bot. 44: 56. 1978.
- LASIOCEPHALUS ROSANUS (Cuatr.) Cuatr., comb. nov.

Senecio rosanus Cuatr. *Brittonia* 8: 43. 1954.

Aetheolaena rosana (Cuatr.) Nord. *Opera Bot.* 44: 56. 1978.

LASIOCEPHALUS SENECIOIDES (HBK) Cuatr., comb. nov.

Cacalia senecioides HBK, *Nov. Gen. Sp. Pl.* 4: 129. 1818, ed. folio.

Senecio assuayensis DC. *Prodr.* 6: 422. 1838.

Aetheolaena senecioides (HBK) Nord. *Opera Bot.* 44: 56. 1978.

LASIOCEPHALUS SUBINVOLUCRATUS (Cuatr.) Cuatr., comb. nov.

Senecio subinvolucratus Cuatr. *Feddes Repert.* 55: 149. 1953.

Aetheolaena subinvolucrata (Cuatr.) Nord. *Opera Bot.* 44: 56. 1978.

LASIOCEPHALUS YACUANQUENSIS (Cuatr.) Cuatr., comb. nov.

Senecio yacuanquensis Cuatr. *Not. Fl. Colomb.* VI: 30, Fig. 23. 1944.

Culcitium karstenii Sch. Bip ex Benoist *Bull. Soc. Bot. Fr.* 95: 305. 1949. *Nomen nudum.*

Aetheolaena yacuanquensis (Cuatr.) Nord. *Opera Bot.* 44: 56. 1978.

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